What is claimed is:

1. A method comprising:

receiving a packet of encoded data; and

decoding the packet using a look-up table that stores

5   information approximating output of an algorithmic decoding

process.

2. The method of claim 1 including performing joint

quantization of the data packet before decoding.

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3. The method of claim 1 wherein data in the packet is

encoded by turbo coding.

4. The method of claim 3 wherein decoding includes

15   processing the data packet using a parallel concatenated

turbo decoder.

5. The method of claim 1 including decoding the packet

using a table that stores information approximating output

20   of a soft-input soft-output algorithmic decoding process, a

soft-input hard-output algorithmic decoding process, a

hard-input soft-output algorithmic decoding process, or a

hard-input hard-output algorithmic decoding process.

6.   A method comprising:

(a) receiving encoded symbols;

(b) compressing the symbols;

(c) decoding the compressed symbols using a first

5   look-up table that stores information approximating output

of an algorithmic decoding process;

(d) arithmetically combining the compressed symbols

with the decoded symbols to obtain a first result; and

(e) decompressing the first result.

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7.   The method of claim 6 including:

(f) interleaving the decompressed first result;

(g) compressing the interleaved first result;

(h) decoding the compressed, interleaved first result

15   using a second look-up table that stores information

approximating output of an algorithmic decoding process;

(i) arithmetically combining the decoded first result

with the compressed, interleaved first result to obtain a

second result;

20   (j) decompressing the second result; and

(k) de-interleaving the decompressed second result.

8.   The method of claim 7 including:

repeating (b) through (k) until predetermined criteria

is satisfied; and

determining information bits corresponding to the

received encoded symbols.

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9. An apparatus comprising:

a memory storing a look-up table with information

approximating output of an algorithmic decoding process;

and

10   a processor configured to use the look-up table to

decode data packets encoded by convolutional coding.

10. The apparatus of claim 9 wherein the table stores

information approximating a soft-input soft-output

15 algorithmic decoding process, a soft-input hard-output

algorithmic decoding process, a hard-input soft-output

algorithmic decoding process, or a hard-input hard-output

algorithmic decoding process.

20 11. The apparatus of claim 10 including a joint

quantization module for converting soft symbols in the

packet into soft multi-symbols prior to the processor's

decoding the data packets using the look-up table.

12. The apparatus of claim 10 wherein the processor is configured to decode the packet by turbo decoding.

13. An apparatus comprising:

5   memory storing a first look-up table with information approximating output of an algorithmic decoding process; and

a processor configured to

(a) compress a packet of received encoded symbols;

10   (b) decode the compressed symbols using the first look-up table;

(c) arithmetically combine the compressed symbols with the decoded symbols to obtain a first result; and

(d) decompress the first result.

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14. The apparatus of claim 13 wherein the memory stores a second look-up table with information approximating output of an algorithmic decoding process and wherein the processor is configured to:

20   (e) interleave the decompressed first result;

(f) compress the interleaved first result;

(g) decode the compressed, interleaved first result using the second look-up table;

(h) arithmetically combine the decoded first result with the compressed, interleaved first result to obtain a second result;

(i) decompress the second result; and

5   (j) de-interleave the decompressed second result.

15. The apparatus of claim 14 wherein the processor is configured to:

repeat (a) through (j) until predetermined criteria is

10 satisfied; and

determine information bits corresponding to the encoded symbols.

16. An article comprising a computer-readable medium that

15 stores computer-executable instruction for causing a computer system, in response to receiving a encoded data packet, to use a look-up table that approximates output of an algorithmic decoding process to decode the packet.

20 17. The article of claim 16 including instructions for causing the computer system to perform joint quantization before using the look-up table to decode the packet.

18. The article of claim 16 wherein data in the packet to be decoded was encoded by turbo coding.

19. An article comprising a computer-readable medium that

5   stores computer-executable instruction for causing a computer system to:

(a) compress a packet of received encoded symbols;

(b) decode the compressed symbols using a first look-up table approximating output of an algorithmic decoding

10 process;

(c) arithmetically combine the compressed symbols with the decoded symbols to obtain a first result; and

(d) decompress the first result.

15 20. The article of claim 19 including instructions for causing the computer system to:

(e) interleave the decompressed first result;

(f) compress the interleaved first result;

(g) decode the compressed, interleaved first result

20 using a second look-up table approximating output of an algorithmic decoding process;

(h) arithmetically combine the decoded first result with the compressed, interleaved first result to obtain a second result;

(i) decompress the second result; and

(j) de-interleave the decompressed second result.

21.   The article of claim 20 including instructions for
causing the computer system to:

repeat (a) through (j) until predetermined criteria is

satisfied; and

determine information bits corresponding to the

encoded symbols.

22.   The article of claim 16 including instructions for

causing the computer system to decode the compressed

symbols using a first look-up table approximating output of

a soft-input soft-output algorithmic decoding process, a

soft-input hard-output algorithmic decoding process, a

hard-input soft-output algorithmic decoding process, or a

hard-input hard-output algorithmic decoding process.

23.   A method comprising:

receiving a packet of encoded symbols;

jointly quantizing multiple symbols;

decoding the jointly quantized symbols to obtain a

result; and

19

decompressing the result into individual decoded

symbols.

24. The method of claim 23 including decoding the jointly

5   quantized symbols using a look-up table that approximates

output of an algorithmic decoding process.

25. The method of claim 23 including decoding the jointly

quantized symbols using a look-up table that approximates

10 output a soft-input soft-output algorithmic decoding

process, a soft-input hard-output algorithmic decoding

process, a hard-input soft-output algorithmic decoding

process, or a hard-input hard-output algorithmic decoding

process.

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26. An article comprising a computer-readable medium that

stores computer-executable instruction for causing a

computer system, in response to receiving a packet of

encoded symbols, to:

20   jointly quantize multiple ones of the symbols;

decode the jointly quantized symbols to obtain a

result; and

decompress the result into individual decoded symbols.

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27. The article of claim 26 including instructions for causing the computer system to decode the jointly quantized symbols using a look-up table that approximates output of an algorithmic decoding process.

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28. The method of claim 26 including instructions for causing the computer system to decode the jointly quantized symbols using a look-up table that approximates output a soft-input soft-output algorithmic decoding process, a

10 soft-input hard-output algorithmic decoding process, a hard-input soft-output algorithmic decoding process, or a hard-input hard-output algorithmic decoding process.